

PROJECT TITLE : SALAMANDER-II
PERIOD COVERED : SEPTEMBER 1980
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The objective of project Salamander-II is to develop zero-ISH cigarettes of commercial quality.

1. RESULTS OF PREVIOUS WORK

Table 1 shows a summary of results of previous experiments using the cigarette SPOTLESS ØS-B-TOT. The smoke had been passed through different filtering systems in order to eliminate or remove certain groups of constituents: "no trap" signifies whole smoke, i.e. the control, "Cambridge filter" means particle phase removed, i.e. gas vapour phase, "charcoal" indicates the remainder of smoke from which virtually the whole organic gas phase (vapour phase) and some NO had been removed, "water" represents a wash bottle switched into the smoke stream, and "water + phenylhydrazine" the equivalent trap for carbonyls.

Tha values in Table 1 would indicate therefore

- a major contribution of the gas phase to the ISH of this cigarette smoke
- no major effect of carbonyl removal on the ISH of the smoke of this cigarette
- some association between NO removal and ISH decrease.

It should be remembered that a survey of some commercial cigarette brands and some experimental cigarettes had shown an association between volatile aldehyde and ISH (Monthly Report, October, 1979). These seemingly paradoxical findings are probably explained by the fact that different families or types of cigarettes differ in the smoke constituent(s) that interact most intensely with cysteine.

2. RESULTS OBTAINED WITH CIGARETTES PREPARED FOR PROJECT SPOTLESS

The 16 cigarettes are listed in Table 2, completed with code information.

The results obtained with these cigarettes are given in Table 3 and figures 1 to 4 show the relation between the main components of the smoke and the ISH values.

With these results the non visible influence of aldehydes is confirmed but there is also no correlation between NO and ISH. The introduction of CO data lets appear a possible correlation between CO and ISH.

The correlation appears better on Figure 5 where the values are given per puff (the R square of the straight line is 0.8).

3. FUTURE PLANS

- Confirmation/invalidation of the correlation between CO and ISH.
- Continuation of the work on derivatives of cysteine, cystine and thiazolidine.

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Table 1 : Trapping of Gas Phase

Trapping system	No trap	Cambridge filter %	Charcoal %	Water %	Water + Phenylhydrazine %
Organic gas phase variation	0	0	-100	-3	100 of aldehydes and ketones
NO variation	0	-5	-48	-20	-32
ISH variation	0	-5	-43	-21	-20

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Table 2 : Prototype Cigarettes of Project Spotless

B Blend (Type MLF)

ØS-B-TOT	100 kg of blend (B-FC, B-BU, B-OR), untreated manufacture of cigarettes
ØS-B-TOT/SPO	30 kg of blend (B-FC, B-BU, B-OR), denitrated manufacture of cigarettes
ØS-B-FC	20 kg of B-FC, untreated manufacture of cigarettes
ØS-B-BU	20 kg of B-BU, untreated manufacture of cigarettes
ØS-B-OR	20 kg of B-OR, untreated manufacture of cigarettes
ØS-B-FC/SPO	30 kg of B-FC, denitrated manufacture of cigarettes
ØS-B-BU/SPO	30 kg of B-BU, denitrated manufacture of cigarettes
ØS-B-OR/SPO	30 kg of B-OR, denitrated manufacture of cigarettes
ØS-B/SPO/SPO/SPO	blend of ØS-B-FC/SPO denitrated ØS-B-BU/SPO denitrated ØS-B-OR/SPO denitrated

A Aircured (Type BRD)

ØS-A-TOT	100 kg of blend (A-MD, A-CH), untreated manufacture of cigarettes
ØS-A-TOT/SPO	30 kg of blend (A-MD, A-CH), denitrated manufacture of cigarettes
ØS-A-MD	20 kg of A-MD, untreated manufacture of cigarettes
ØS-A-CH	20 kg of A-CH, untreated manufacture of cigarettes
ØS-A-MD/SPO	30 kg of A-MD, denitrated manufacture of cigarettes
ØS-A-CH/SPO	30 kg of A-CH, denitrated manufacture of cigarettes
ØS-A/SPO/SPO	blend of ØS-A-MD/SPO denitrated ØS-A-CH/SPO denitrated

Table 2 (cont'd) : Code System

First Sign : Ø (zero) for the year 1980
B : for Blend
A : for Aircured
SPO : for denitrated

We decided to use two types of blend for the SPOTLESS project:

B Blend (Type MLF)

This blend has the following composition:

B-FC/Partie No. 834	Fluecured (US + ET No. 2)	31.0 %
B-BU/Partie No. 835	Burley (US + Subst.) + RL	53.7 %
B-OR/Partie No. 836	Oriental	15.3 %
		<hr/>
		100.0 %
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This blend is made according to the MLF Version Atlantic 8222 (1).

A Aircured (Type BRD)

This blend has the following composition:

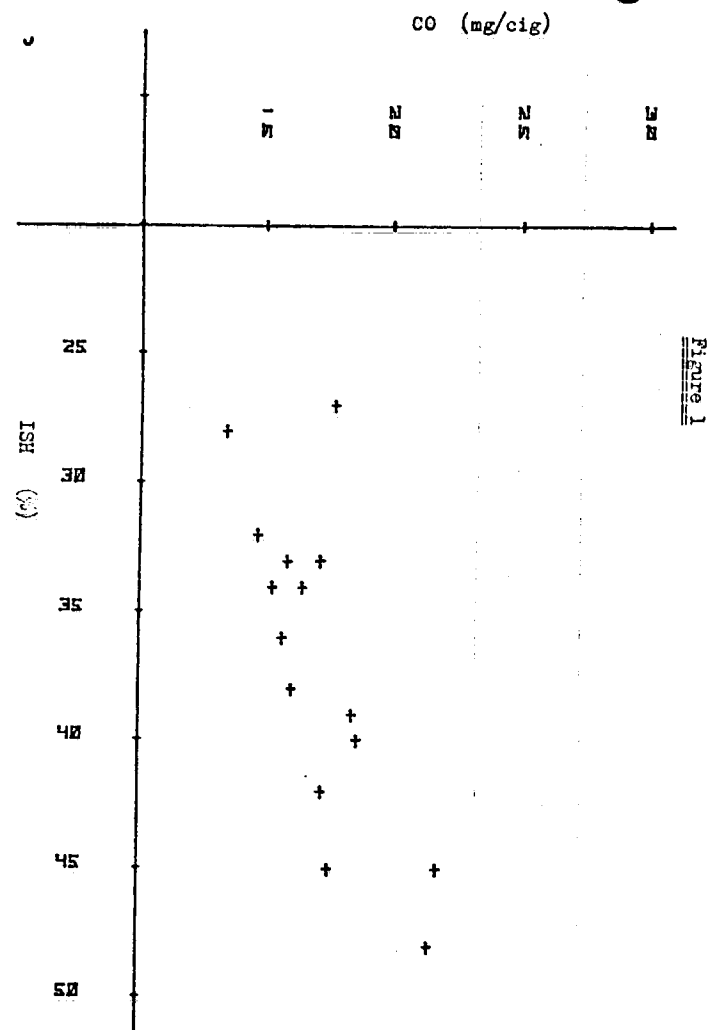
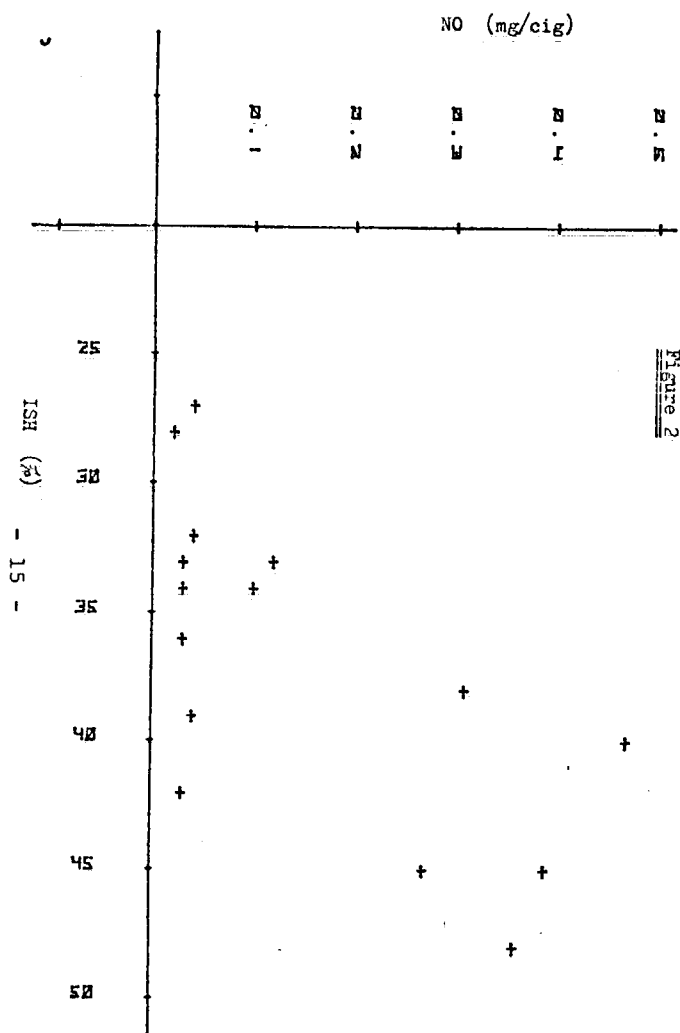
A-MD/Partie No. 832	Maryland (US + IT) + Oriental + RL	88.0 %
A-CH/Partie No. 833	Swiss (strips)	12.0 %
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		100.0 %
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This blend is made according to the BRD Version Atlantic 8331 (2).

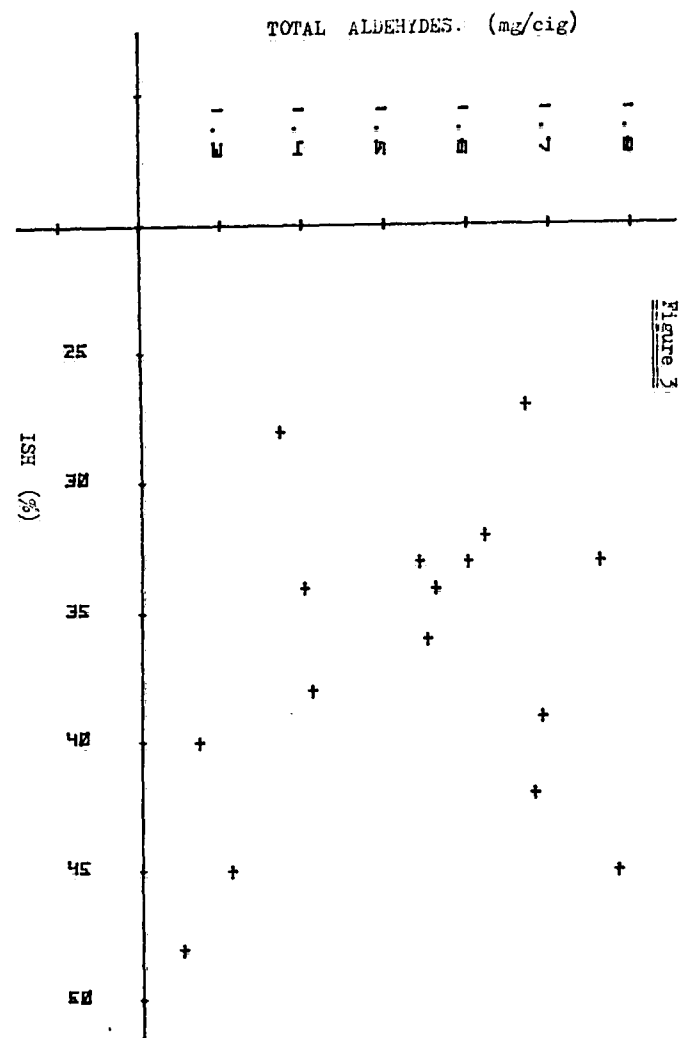
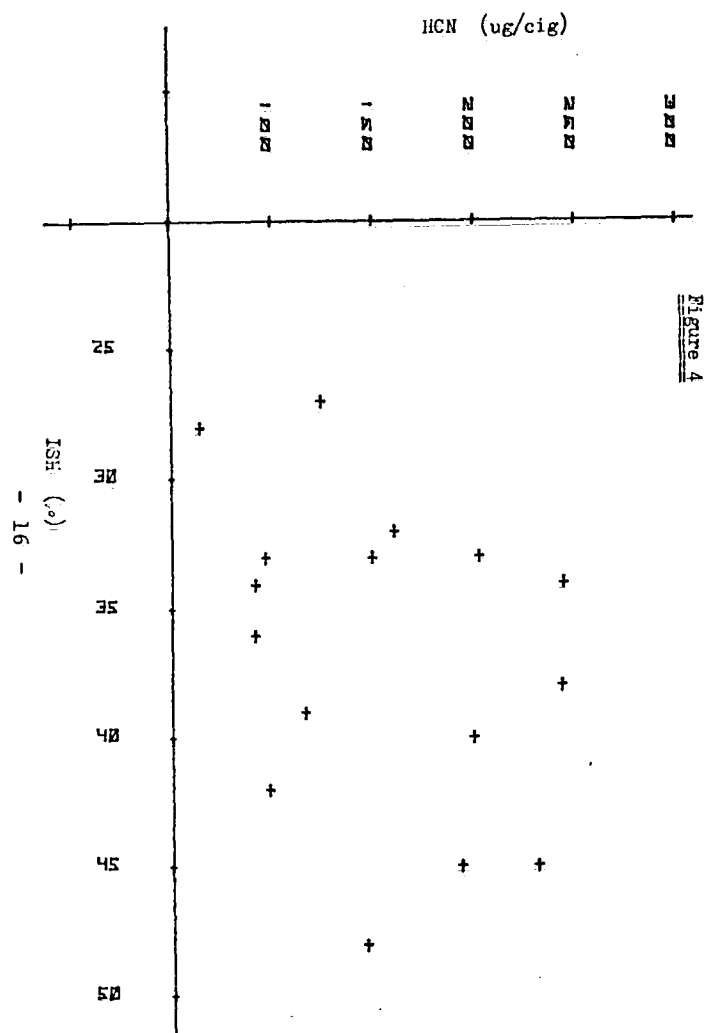
Table 3 : Spotless Cigarettes

CIGARETTES	PUFFS	CO mg/cig	NO mg/cig	HCN mg/cig	Ald. Tot. mg/cig	ISH	ISH/PUFF
1 OS-A-TOT	6.6	17.6	0.27	193	1.31	45	6.8
2 OS-A-TOT/SPO	6.8	18.5	0.04	116	1.69	39	5.7
3 OS-A-MD	8.3	21.8	0.39	231	1.78	45	5.4
5 OS-A-MD/SPO	7.0	17.3	0.03	98	1.68	42	6.0
4 OS-A-CH	7.2	21.5	0.36	146	1.25	48	6.7
6 OS-A-CH/SPO	7.4	17.7	0.04	124	1.67	27	3.65
1 OS-B-TOT	8.0	16.1	0.31	243	1.41	38	4.75
2 OS-B-TOT/SPO	6.4	15.3	0.03	91	1.40	34	5.3
3 OS-B-FC	8.3	16.5	0.10	244	1.56	34	4.1
6 OS-B-FC/SPO	7.1	15.9	0.03	149	1.76	33	4.65
4 OS-B-BU	7.7	18.7	0.47	199	1.27	40	5.2
7 OS-B-BU/SPO	6.3	13.4	0.02	64	1.37	28	4.45
5 OS-B-OR	15.7	17.2	0.12	202	1.54	33	2.1
8 OS-B-OR/SPO	7.1	14.7	0.04	160	1.62	32	4.5
7 OS-A/SPO/SPO	7.1	17.2	0.03	96	1.60	33	4.65
9 OS-B/SPO/SPO/SPO	6.9	15.7	0.03	91	1.55	36	5.2

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